

## Steering Shaft, Manual Steering Rack, 1994-04 Mustang (MMST-15.2)



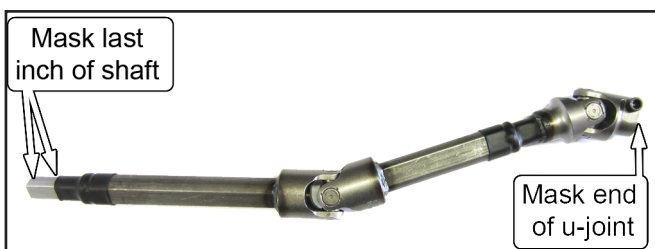
Read all instructions before beginning work. Following instructions in the proper sequence will ensure the best and easiest installation.

The MM Engineering Team designed a new steering shaft that does not use setscrews. That's right, *no setscrews!* Instead, the U-joints are attached by welding them to the shafts. The steering shaft assembly is attached to the steering rack with a pinch-bolt, just like Ford did with the stock steering shaft assembly. And like the stock steering shaft, the MM Steering Shaft also has two telescoping sections.

### Preparation

The MM Steering Shaft is manufactured with a bare steel finish. If desired, it can be painted before installation. Please follow these painting guidelines to avoid damage to the steering shaft:

- Collapse each section of the shaft approximately half-way, without removing the plastic dust boots.
- Wipe off any grease or oil.
- Mask off the end of the lower U-joint and the last inch of the upper shaft so they don't get painted.
- Paint the steering shaft and allow it to fully dry before installation.



### Instructions

**WARNING:** If the steering wheel is rotated too many revolutions in either direction the electrical wires (known as the clock spring) that connect to the air-bag, horn, and other electrical controls will be severed. From the factory, the steering wheel is centered within it's rotational range. It is important not to lose this position while the steering wheel is disconnected from the steering rack.

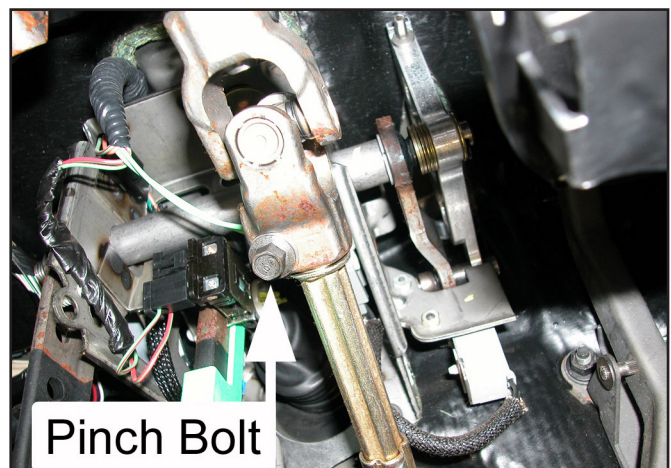
**NOTE:** You must consult a factory manual on the procedure for centering the clock spring should the steering wheel's center position be lost.

1. Raise the front of the car and place it safely on jack stands.
2. Install a manual steering rack per the manufacturer's specifications.

**NOTE:** When installing a manual rack on an MM k-member, the MMST-8 steering rack spacers are required.

**NOTE:** Visually check that the rack is roughly centered in its travel range before installing it. One of the dust boots extended further than the other is a good indication that the rack is not centered. Rotate the input shaft by hand to center the rack if necessary.

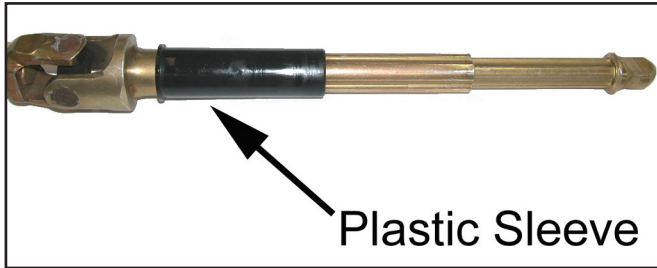
3. Remove the stock steering shaft. There is a pinch bolt, located underneath the dash, where the steering shaft connects to the stock upper U-joint. Remove only the pinch bolt located nearest the firewall so that the stock upper U-joint remains in the vehicle.



- Carefully remove the plastic sleeve located on the upper portion of the stock steering shaft. If removal is difficult, heat the plastic sleeve with a heat gun or similar heat source until it expands enough for removal.

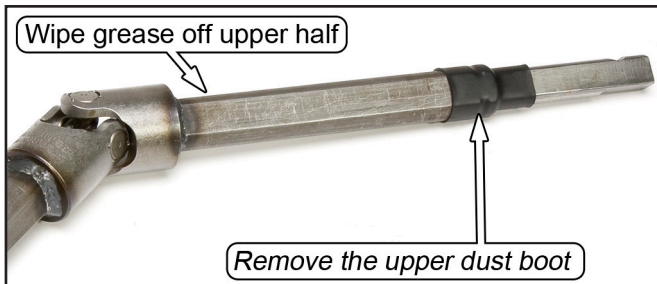
*NOTE: The plastic sleeve will be reused with the MM Solid Steering Shaft.*

*NOTE: Do not damage this sleeve. New replacements are not available.*



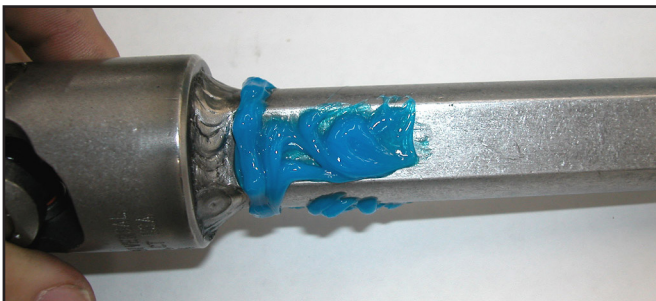
- Remove the dust boot from the upper telescoping joint of the MM Solid Steering Shaft.

*NOTE: It should slide off with just a little bit of effort.*



- Wipe off any grease or oil located on the inside diameter of the plastic sleeve.
- Wipe off any grease or oil located on the outside diameter of the upper half of the MM Solid Steering Shaft, specifically along the first 3" where the shaft is welded to the U-joint.
- Apply RTV silicone sealant to the first 1"-2" of the upper half of the MM Solid Steering Shaft. Start at the weld bead and work outwards from there.

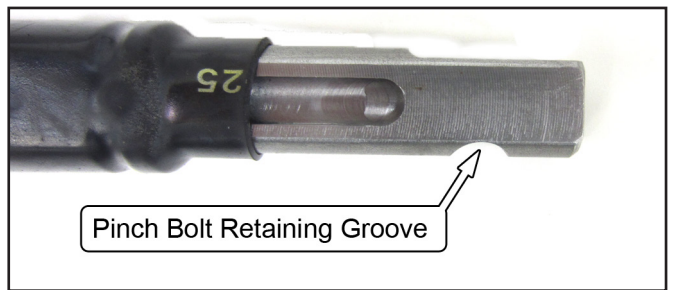
*NOTE: A majority of the silicone should be placed on the flat faces of the shaft.*



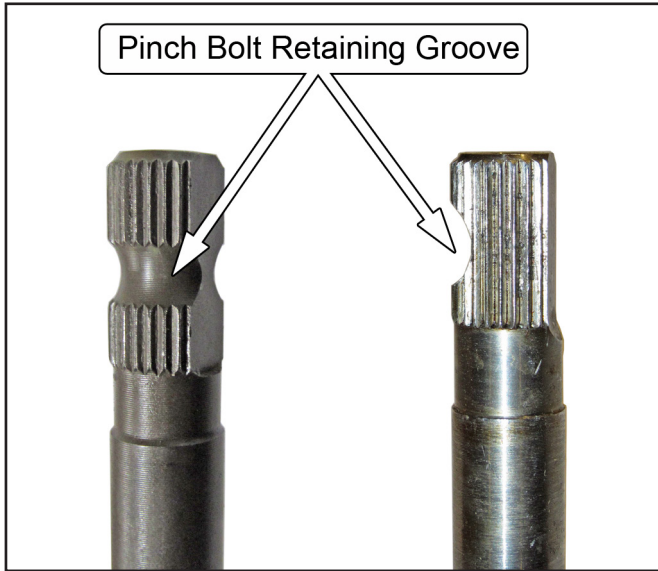
- Slowly slide the plastic sleeve removed in Step 4 over the upper half of the MM Solid Steering Shaft, until the flanged portion of the sleeve is touching the weld bead.
- Evenly spread the excess silicone over the plastic flange, until there is no gap between the plastic sleeve and the flats of the shaft. The goal is to prevent fumes and noise from the engine bay entering the passenger compartment through the gap between the steering shaft and the plastic sleeve.



- Allow the steering shaft to sit for an hour to ensure that the silicone is dry before continuing with the rest of the installation.
  - Reinstall the dust boot over the upper telescoping joint.
  - Remove the lower U-joint from the MM Solid Steering Shaft.
  - Install the upper half of the steering shaft through the hole in the firewall.
  - Extend the MM Solid Steering Shaft enough to allow the upper half of the shaft to attach to the stock upper U-joint, located underneath the dash.
- NOTE: The steering shaft can only be attached to the U-joint in one orientation.*
- Insert the pinch-bolt into the stock upper U-joint, through the pinch bolt retaining groove on the MM Solid Steering Shaft, and torque to 24 ft-lbs.



17. Locate the pinch bolt retaining groove on the steering rack input shaft. This feature will vary depending on the manufacturer of your steering rack.

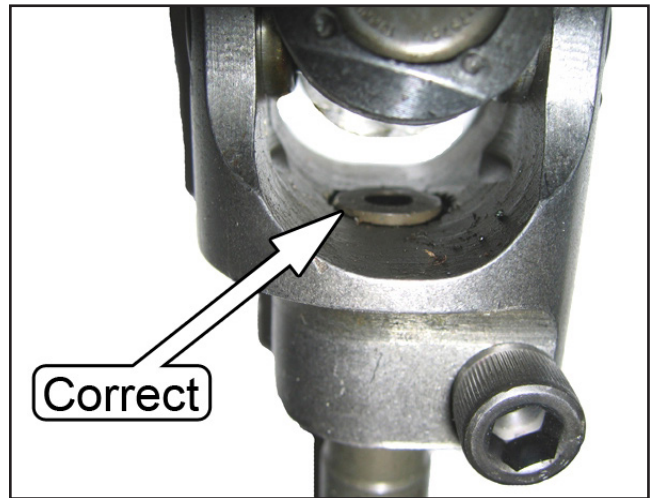
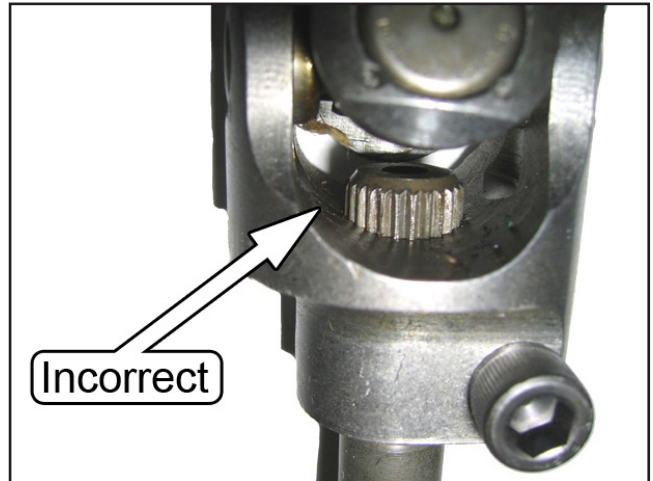


18. Install the lower U-joint onto the input shaft of the steering rack. Orient the lower u-joint so that when inserted, the pinch bolt passes through the retaining groove.

*NOTE: The groove is a safety feature that prevents the U-joint from pulling off the steering rack input shaft in the event of the installed pinch bolt coming loose.*

*NOTE: The pinch bolt must be inserted through the unthreaded hole of the U-joint first, in order to properly clamp the joint.*

**WARNING: The top of the steering rack input shaft should be flush with the top of the lower U-joint splined section. If the input shaft protrudes past the lower U-joint's splined section interference within the U-joint will occur as it is rotated. Also, if the input shaft is not fully inserted into the lower U-joint's splined section, it will not be securely attached, and may work itself loose over time.**



19. Install and torque the lower U-joint, bottom pinch bolt to 24 ft-lbs.
20. Install the lower end of the MM Solid Steering Shaft into the lower U-joint. Install the pinch bolt, but do not tighten.

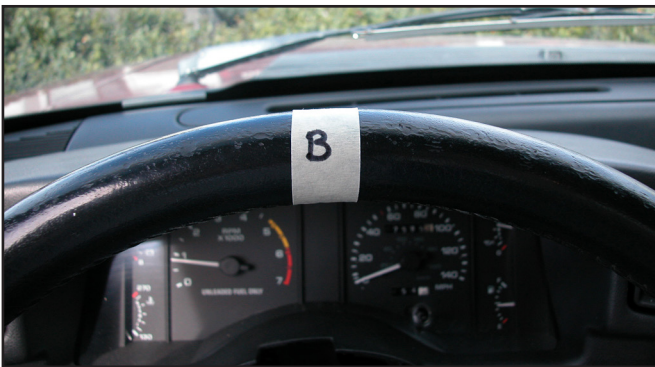
## Centering the Steering Rack

The following step-by-step procedure details how to ensure that the steering rack is centered.

21. Rotate the steering wheel clockwise until full lock is reached.
22. Place a piece of tape on the current twelve o'clock position of the steering wheel and mark the letter "A" on the tape.

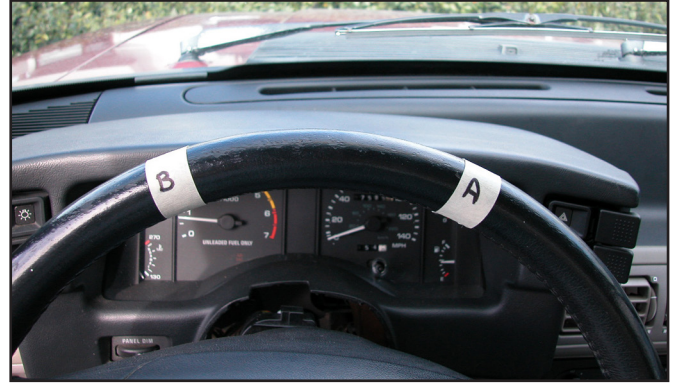


23. Rotate the steering wheel counter-clockwise until full lock is reached. For future reference (in Step 24), count the number of turns required to turn the steering wheel from full lock to full lock.
24. While holding the wheel at full-lock in the counter-clockwise direction, place a piece of tape on the steering wheel in its current twelve o'clock position. Mark the letter "B" on the tape.



25. Divide the number of turns required to go from full lock to full lock in Step 23, by 2.
26. From the counter-clockwise full lock position, turn the steering wheel clockwise the amount calculated in Step 25. The steering rack will now be centered. Note that the steering wheel may not be clocked (centered) correctly even when the rack itself is centered. Proper clocking of the steering wheel is covered in later steps.

27. If the steering rack was correctly centered in Step 26, the "A" and "B" tape marks on the steering wheel will now be an equal distance away from the twelve o'clock position. If the tape marks are at unequal distances from twelve o'clock, the rack is not centered and the "Centering the Steering Rack" steps should be repeated until they are at equal distances.



## Clocking the Steering Wheel

The previously described procedure will center the steering rack. It does NOT correctly clock the steering wheel.

28. Remove the tape from the steering wheel.
29. After Step 26, the steering rack will be centered. Without rotating the input shaft of the steering rack, disconnect the lower end of the MM Solid Steering Shaft from the lower U-joint by removing the pinch bolt and collapsing the lower telescoping section  
**WARNING:** Do NOT disconnect the lower U-joint from the steering rack.
30. Rotate the steering wheel so that it is centered in the "straight-ahead" position.

**WARNING:** Do NOT rotate the steering wheel more than one rotation in either direction or damage to the air bag clockspring can occur.



31. Reconnect the lower U-joint to the lower end of the MM Solid Steering Shaft by extending the telescoping section enough to slip the splines together.
32. Install and torque the lower U-joint, top pinch bolt to 24 ft-lbs.
33. Safely lower the car to the ground.
34. If the steering rack was replaced during this installation, readjust the toe setting according to the vehicle manufacturer specifications.

This kit includes:

- 1 Solid Steering Shaft Assembly